An ocular manifestation of hand, foot and mouth disease

Abstract

Objective: This report details an atypical presentation of hand, foot, and mouth disease (HFMD) in a 35-year-old female.
Method: The patient presented with acute unilateral painless central vision loss with recent coryzal symptoms and a vesicular rash on her hands and feet. Investigation revealed retinal pigment epithelium (RPE) disruption and subretinal thickening infero-nasally to the fovea.
Results: Orbital corticosteroids were successfully administered. The investigative and management approach has been compared to that of similar cases available in the literature.
Conclusion: This report summarises a case report and a review of available literature on HFMD associated maculopathy, providing an overview on the condition.

Keywords: ophthalmology, coxsackie, maculopathy, case report

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Introduction

Hand, foot, and mouth disease (HFMD) is a common systemic viral infection occurring in childhood or immunocompromised adults, caused most commonly by Coxsackievirus A16 (C-A16) and Enterovirus 71 (EV-71) [1]. Characteristics of HFMD include a maculopapular rash over the hands and feet with mouth ulcers. Whilst usually HFMD is a self-limiting condition which resolves spontaneously, complications can occur. Rare and severe complications, including neurological complications and pulmonary oedema, result in mortality or morbidity, are usually attributed to EV-71 [2], [3]. Mortality rates vary by outbreak but have been reported as 0.03–0.78% of reported cases [2], [4]. Ocular involvement is also rare, but can manifest a variety of ophthalmic conditions. The most reported ocular manifestation of HFMD is acute maculopathy, presenting as unilateral acute vision loss or a scotoma [5].

Case description

A 35-year-old female presented to general hospital emergency eye casualty with a one-day history of painless central loss of vision in her right eye. She experienced no floaters or flashes and denied any ocular trauma. She was a non-smoker with no significant medical history, with no new sexual partners and took no regular medications. On further questioning, five days previously, she had experienced flu-like symptoms including a fever, headache and coryzal symptoms. She had noted mouth ulcers with a vesicular rash on her hands and feet. These symptoms were self-limiting and resolved within a few days. The patient's 3-year-old son had experienced the same coryzal symptoms a week previously, which had also resolved spontaneously. The patient's son had no ocular symptoms. He had been clinically diagnosed with a self-limiting case of HFMD by their General Practitioner and further diagnostic tests were not warranted in line with national guidance [1], [6].
On examination, unaided visual acuity was 6/60 in the right eye and 6/6 in the left. Anterior segment examination of both eyes was normal, with no signs of anterior uveitis or relative afferent pupillary defect.
Fundal examination of the left eye was normal. In the right eye, fundal examination revealed an area of grey discolouration with retinal pigment epithelium (RPE) disruption and subretinal thickening infero-nasally to the fovea (Figure 1).
Spectral-domain Optical Coherence Tomography (SD-OCT) was completed. SD-OCT of the left eye was normal. The discolouration seen on fundal examination in the right eye corresponded to an area of hyper-reflectivity along the RPE (Figure 2). Routine bloods tests, syphilis serology and QuantiFERON tests were normal.
Based on the patient's clinical findings and reported history, a clinical diagnosis of HFMD associated acute maculopathy was made. Clinical investigation was consistent with signs and symptoms of a maculopathy and the patient's symptoms and contact history were suggestive of HFMD as the causative illness. There was no evidence to suggest EV-71 as the causative organism (such as recent travel to Southeast Asia), hence further PCR (polymerase chain reaction) testing was not completed [6].
After further clinical discussion, including explaining different treatment options a decision was made (based on the severity of the patient's symptoms) to trial an orbital

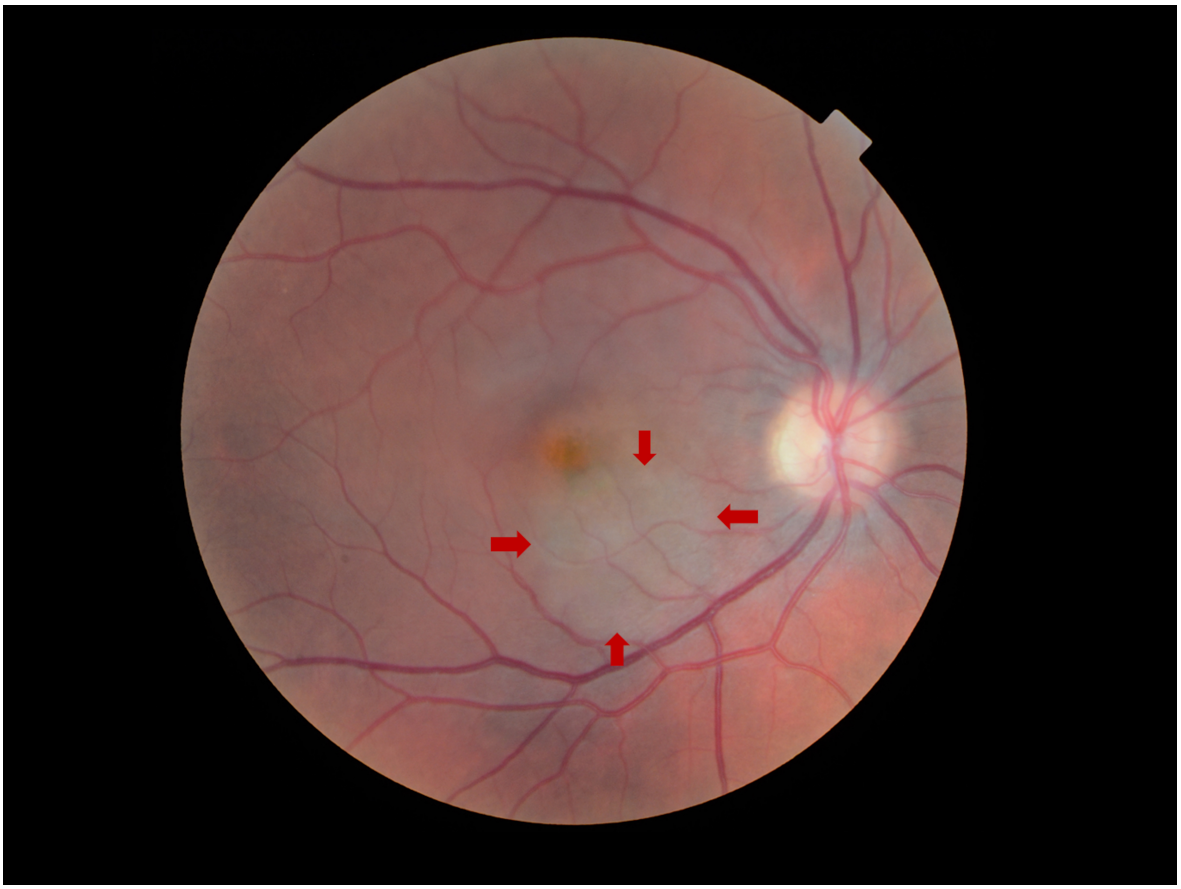


Figure 1: Fundus photograph of the right eye showing an area of grey discolouration, retinal pigment epithelium disruption and subretinal thickening infero-nasally to the fovea



Figure 2: Spectral domain optical coherence tomography demonstrating subretinal hyper-reflective material

Table 1: Ocular manifestations with corresponding enterovirus serotypes

Study	Ocular manifestation	Causative viral serotype identified	Case numbers
Beck et al. (2004) [10]	Acute maculopathy	Coxsackie A16 and Coxsackie B6	Single case
Kim et al. (2021) [19]	Pseudomembranous conjunctivitis	Enterovirus 71	Single case
Förster et al. (1993) [20]	Panuveitis	Coxsackie B3	Single case
Kadrmas et al. (1999) [21]	Chorioretinitis	Coxsackie B4	Single case
Mine et al. (2017) [22]	Retinal Vasculitis	Coxsackie A4	Single case
Takeuchi et al. (2003) [23]	Uveoretinitis	Coxsackie B4	Single case

floor triamcinolone injection (0.5 ml triamcinolone acetonide 40 mg/ml).
On follow-up two weeks later, the patient's ocular symptoms resolved with visual acuity improving to 6/6 leaving minimal RPE disruption.

Discussion

HFMD commonly affects children, with highest prevalence among children under five years [7]. It presents with flu-like symptoms and pathognomonic maculopapular rash on the hands, feet and mouth with oral ulcers [1]. The method of transmission is via droplets or direct contact. Carrier viral shedding can last between one to twelve weeks [2]. HFMD is usually a self-limiting condition.
Other differentials, that may present with a palmar plantar rash include dermatitis and eczema, however these would not present with flu-like symptoms [8]. Other conditions which could be present similarly include secondary syphilis.
Maculopathy with recent HFMD was first reported in 1996 [9]. In 2004, the first case report to demonstrate positive viral titres for Coxsackie A16 and B6 at the time of symptomatic maculopathy was published [10]. More recently, PCR testing is beginning to be utilised in a diagnostic setting, although this remains uncommon [11]. The vast majority of literature identified simply rely upon clinical diagnosis, as in this report.
Documented ocular manifestations of HFMD remain uncommon and the pathophysiology of these ocular manifestations remain largely unknown. Generally, two hypotheses have been suggested. Firstly, direct haematogenous spread of the virus has been demonstrated in vitro [12], [13]. Alternatively, molecular mimicry and autoimmune mediated response have also been suggested as a possible aetiology [12], [13].
In this case, a diagnosis was made based on the classical clinical symptoms of HFMD. In line with current British guidelines, no viral PCR or blood tests were sent [1], [6]. As per clinical guidelines, if the patient had been pregnant, or suspicion of EV-71 infections had been high (including recent travel to Asia), viral PCRs could have been useful [6], [14]. Furthermore, it may be sensible to carry our PCR testing if symptoms had not been consistent with HFMD or a typical maculopathy, to exclude alternative diagnoses. Whilst investigating the viral serotype provides minimal clinical benefit, it may be of academic interest to collect data regarding serotypes and their correlation to ocular manifestations. Several reports have linked HFMD with alternative ocular manifestations including conjunctivitis, uveitis, retinal detachment and vasculitis [15], [16]. However presently, it is impossible to assess for correlations to certain serotypes and ocular manifestations, given the limited data. Table 1 summarises some of the ocular manifestations with corresponding viral serotype identified in the available literature.
In this case, only standard fundus photography and SD-OCT were employed. However, in the literature, multiple papers are dedicated to multimodal imaging of maculopathies associated with HMFD [12], [17], [18]. These papers use imaging to further understand disease progression and pathophysiology of HFMD associated maculopathy [12], [17]. Each case series demonstrated inflammatory evolution, which resolved on follow-up. Anjou et al. used fluorescein angiography, fundus autofluorescence and indocyanine green angiography to suggest that inflammation originated at the inner choroid [18]. Jung et al. and Vaz-Pereira et al. used the same imaging modalities but were unable to confirm initial choroid inflammation, but instead found evidence of inflammation at the RPE, choroid and outer retina [13], [17]. Perhaps most crucially, all papers noted that improvements in inflammation, corresponded to visual improvements [12], [17], [18].
Treatment options are limited for viral maculopathy. Much of the literature advocates a 'watch and wait' strategy with regular follow-up and review [12], [17], [19]. This conservative approach relies on the self-resolution of HFMD. Conversely, Agrawal et al. demonstrated oral steroids can be utilised with no adverse effects [15]. Steroids have been hypothesised to limit tissue damage, although no literature could be identified that specifically investigated this [12]. In this case an orbital floor corticosteroid injection was trialled given the significant and rapid sight loss, to no adverse effect and full resolution of acuity.

Conclusion

In patients presenting with an acute unilateral vision loss preceded by a flu-like illness, clinicians should consider a viral cause as a possible differential diagnosis. Whilst uncommon, multiple different systemic viral illnesses have been documented to cause acute onset maculopa-

thies and other ocular manifestations. Further work is needed to understand the pathophysiology behind these ocular manifestations, as the literature remains sparse. When managing cases of acute unilateral maculopathies, clinicians should prioritise timely and appropriate assessment and management. It is important to exclude infectious uveitic causes, such as syphilis and tuberculosis. Furthermore, follow-up is necessary to ensure adequate resolution of symptoms.

Notes

Patient consent

The authors certify that they have obtained written consent from the patient. The patient has given their consent for their images and other clinical information to be reported. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity.

Competing interests

The authors declare that they have no competing interests.

References

1. Ventarola D, Bordone L, Silverberg N. Update on hand-foot-and-mouth disease. Clin Dermatol. 2015 May-Jun;33(3):340-6. DOI: 10.1016/j.clindermatol.2014.12.011
2. World Health Organization. A guide to clinical management and public health response for hand, foot and mouth disease (HFMD). 2011 [accessed 2023 Mar]. Available from: https://apps.who.int/iris/bitstream/handle/10665/207490/9789290615255_eng.pdf
3. Centers for Disease Control and Prevention (CDC). Deaths among children during an outbreak of hand, foot, and mouth disease--Taiwan, Republic of China, April-July 1998. MMWR Morb Mortal Wkly Rep. 1998 Aug 7;47(30):629-32.
4. Qiu J, Yan H, Cheng N, Lu X, Hu X, Liang L, Xiao Z, Tan L. The Clinical and Epidemiological Study of Children with Hand, Foot, and Mouth Disease in Hunan, China from 2013 to 2017. Sci Rep. 2019 Aug 12;9(1):11662. DOI: 10.1038/s41598-019-48259-1
5. Yannuzzi LA, Jampol LM, Rabb MF, Sorenson JA, Beyrer C, Wilcox LM Jr. Unilateral acute idiopathic maculopathy. Arch Ophthalmol. 1991 Oct;109(10):1411-6. DOI: 10.1001/archopht.1991.01080100091049
6. National Institute for Health and Care Excellence. Clinical Knowledge Summaries: Hand, foot and mouth disease. 2020 Aug [accessed 2023 Mar]. Available from: https://cks.nice.org.uk/topics/hand-foot-mouth-disease/
7. Liu Z, Tian J, Wang Y, Li Y, Liu-Helmersson J, Mishra S, Wagner AL, Lu Y, Wang W. The burden of hand, foot, and mouth disease among children under different vaccination scenarios in China: a dynamic modelling study. BMC Infect Dis. 2021 Jul 5;21(1):650. DOI: 10.1186/s12879-021-06157-w
8. Gangar J, Thiagarajan K, Veeraraghavan N. Pruritic Rash on the Hands and Feet. Am Fam Physician. 2018 Dec 1;98(11):685-6.
9. Freund KB, Yannuzzi LA, Barile GR, Spaide RF, Milewski SA, Guyer DR. The expanding clinical spectrum of unilateral acute idiopathic maculopathy. Arch Ophthalmol. 1996 May;114(5):555-9. DOI: 10.1001/archopht.1996.01100130547007
10. Beck AP, Jampol LM, Glaser DA, Pollack JS. Is coxsackievirus the cause of unilateral acute idiopathic maculopathy? Arch Ophthalmol. 2004 Jan;122(1):121-3. DOI: 10.1001/archopht.122.1.121
11. Yen CY, Fang IM. Unilateral acute idiopathic maculopathy related to hand-foot-mouth disease: Case report and literature review. Taiwan J Ophthalmol. 2023 Jan 6;14(1):133-6. DOI: 10.4103/tjo.TJO-D-22-00139
12. Duman R, Duman N, Kutluksaman B, Çetinkaya E, İnan S, İnan ÜÜ. A review of unilateral acute idiopatic maculopathy related to hand-foot-mouth disease with a representative case. Int Ophthalmol. 2016 Jun;36(3):445-52. DOI: 10.1007/s10792-015-0147-6
13. Jung CS, Payne JF, Bergstrom CS, Cribbs BE, Yan J, Hubbard GB 3rd, Olsen TW, Yeh S. Multimodality diagnostic imaging in unilateral acute idiopathic maculopathy. Arch Ophthalmol. 2012 Jan;130(1):50-6. DOI: 10.1001/archophthalmol.2011.359
14. Reich M, Cakir B, Cvetkoski S, Lang SJ, Stahl A, Ness T, Agostini H, Lange C. Acute unilateral maculopathy associated with adult onset of hand, foot and mouth disease: a case report. BMC Ophthalmol. 2019 May 7;19(1):104. DOI: 10.1186/s12886-019-1111-4
15. Agrawal R, Bhan K, Balaggan K, Lee RW, Pavesio CE, Addison PK. Unilateral acute maculopathy associated with adult onset hand, foot and mouth disease: case report and review of literature. J Ophthalmic Inflamm Infect. 2015 Feb 1;5:2. DOI: 10.1186/s12348-015-0034-3
16. Taylor S, Khan M, Zaidi S, Alvi U, Fatima Y. Central serous retinopathy and hand-foot-mouth disease: coincidence or causation? Int Med Case Rep J. 2018 Oct 18;11:277-82. DOI: 10.2147/IMCRJ.S181088
17. Vaz-Pereira S, Macedo M, De Salvo G, Pal B. Multimodal imaging of exudative maculopathy associated with hand-foot-mouth disease. Ophthalmic Surg Lasers Imaging Retina. 2014 Apr 4;45(3):e14-7. DOI: 10.3928/23258160-20140331-01
18. Anjou M, Fajnkuchen F, Nabholz N, Nghiem-Buffet S, Mrejen S, Giocanti-Aurégan A. Multimodal Imaging of Unilateral Acute Maculopathy Associated with Hand, Foot, and Mouth Disease: A Case Series. Case Rep Ophthalmol. 2022 Aug 16;13(2):617-25. DOI: 10.1159/000525940
19. Kim YJ, Kim TG. Pseudomembranous conjunctivitis with hand, foot and mouth disease in a pregnant woman: a case report. BMC Ophthalmol. 2021 Mar 2;21(1):113. DOI: 10.1186/s12886-021-01878-7
20. Förster W, Bialasiewicz AA, Busse H. Coxsackievirus B3-associated panuveitis. Br J Ophthalmol. 1993 Mar;77(3):182-3. DOI: 10.1136/bjo.77.3.182
21. Kadrmas EF, Buzney SM. Coxsackievirus B4 as a cause of adult chorioretinitis. Am J Ophthalmol. 1999 Mar;127(3):347-9. DOI: 10.1016/s0002-9394(98)00322-5
22. Mine I, Taguchi M, Sakurai Y, Takeuchi M. Bilateral idiopathic retinal vasculitis following coxsackievirus A4 infection: a case report. BMC Ophthalmol. 2017 Jul 19;17(1):128. DOI: 10.1186/s12886-017-0523-2
23. Takeuchi M, Sakai J, Usui M. Coxsackievirus B4 associated uveoretinitis in an adult. Br J Ophthalmol. 2003 Apr;87(4):501-2. DOI: 10.1136/bjo.87.4.501

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